

*Response to Office Action in Serial No.: 09/938,122
mailed June 9, 2004 and RCE
Page 4 of 20*

II. AMENDMENT TO THE CLAIMS

Amendments Made Herein and Summary of Status of Claims

- **Please cancel claim 1, 2, 4-7, 9-12, 14, 16, 20-28, 30 and 31, without prejudice.**

Claims 3, 8, 15, 17-19, 29, and 33 are pending after the amendments set forth below are entered. Claims 3, 8, 15, 17-19, and 29 have been amended without disclaimer. Claim 33 has been newly added. No new matter has been introduced with this amendment. The claims are fully supported by the instant disclosure.

Statement with Respect to Scope of Amended and Non-Amended Claims

Revisions to the claim set is made in order to streamline prosecution of this case in order to obtain early allowance of embodiments that are presently anticipated to be of commercial significance. It is asserted that claim revisions are not made for a purpose of patentability. Any amendment, cancellation, withdrawal or addition made herein with respect to the claims should not be construed in any manner as indicating Applicants' surrender of any subject matter of the application, or surrender of any equivalent to any element asserted in one or more claims. Any narrowing which may be evinced with respect to subject matter covered by the claims as a whole, or by one or more claims of the appended claims whether amended, re-represented, or new, when compared to claims previously in the application, should not be interpreted as indicating that the Applicants have generally disclaimed the territory between the original claimed subject matter and the amended claimed subject matter. Amended claims elements are to be construed to include substantial equivalents known to those of ordinary skill in the art.

110161404v3

*Response to Office Action in Serial No.: 09/938,122
mailed June 9, 2004 and RCE
Page 5 of 20*

Applicants assert that any amendments transacted herein are made without prejudice and reserve all rights to prosecute any canceled claims, and claim structures preceding any amendment to a particular claim, and other disclosed (but not presently claimed) embodiments in the application, in future continuation applications, divisional applications, continuation-in-part applications, continuing prosecution applications, requests for continuing examination, re-examination applications and any other application claiming priority to the present application.

▪ **COMPLETE LIST OF CLAIMS THAT ARE OR HAVE BEEN BEFORE THE
OFFICE AFTER ENTRANCE OF THE AMENDMENTS MADE HEREIN**

The following claims constitute a complete list of claims that are or have been before the office after entrance of the amendments made herein. Amendments to the claims are indicated in accord with Revised 37 C.F.R. §1.121. In accord with such regulation, the listing of claims set forth below replaces all prior versions, and listings, of claims in the application, with cancelled and not entered claims not being re-presented:

--CLAIMS AS PENDING IN THE APPLICATION WITH AMENDMENTS MADE
HEREIN START ON THE NEXT PAGE--

Response to Office Action in Serial No.: 09/938,122
mailed June 9, 2004 and RCE
Page 6 of 20

1.-2. (CANCELLED)

3. (CURRENTLY AMENDED) The process as claimed in claim 33 ~~[[1]]~~ wherein the process is performed in semi-continuous mode with ethylene being fed continuously during each period of the process sufficient for preparing a batch of the olefins.

4.-7. CANCELLED

8. (CURRENTLY AMENDED) The process as claimed in claim 33 ~~[[5]]~~ wherein the mole ratio of the components in steps (i) and (iii) to the component in step (ii) ranges from
~~Et₂Al component is reacted with the Zr(OR)₄ component in the mole ratio of 10:1 to 60:1.~~

9.-14. (CANCELLED)

15. (CURRENTLY AMENDED) The process as claimed in claim 33 ~~[[1]]~~ wherein, the process is carried out for a time period in the range of 1 hour to 3 hours.

*Response to Office Action in Serial No.: 09/938,122
mailed June 9, 2004 and RCE
Page 7 of 20*

16. **(CANCELLED)**

17. **(CURRENTLY AMENDED)** The process as claimed in claim 33 [[2]] wherein the oligomerization reaction is carried out at an agitator speed of 300 to 1000 rpm.

18. **(CURRENTLY AMENDED)** The process as claimed in claim 33 [[1]] wherein, the zirconium component is selected from the group consisting of zirconium tetra cresylate, zirconium tetra-dimethyl phenolate, zirconium tetra n-butoxide, zirconium tetra isopropoxide, zirconium tetra n-propoxide, zirconium tetra-butyrate and zirconium tetra-isobutyrate, each in the presence of ~~association with~~ an alcohol at a ratio of 1:0.33 to 1:1.23.

19. **(CURRENTLY AMENDED)** The process as claimed in claim 33 [[1]] wherein the process said catalyst includes an addition of a thiophene ~~as a third component~~ to reduce or limit chain growth.

20.-28. **(CANCELLED)**

*Response to Office Action in Serial No.: 09/938,122
mailed June 9, 2004 and RCE
Page 8 of 20*

29. **(CURRENTLY AMENDED)** The process as claimed in claim 33 ~~[[25]]~~ wherein said alkyl aluminum of step (i) is selected from the group consisting of: ethyl aluminum and triethyl aluminum; and wherein said alkyl aluminum halide is ethyl aluminum sesquichloride ~~toluene, n-Octane and cyclohexane.~~

30.-31 **(CANCELLED)**

32. **(CURRENTLY AMENDED)** The process of claim 33 ~~[[31]]~~ wherein the catalytic component of step (ii) ~~zirconium (IV)-alkoxide-alcohol-preparation~~ consists of $Zr(OBu)_4$ ~~[[.]]~~ in BuOH ~~[[.]]~~ having a mole ratio of 1:0.33 to 1:1.23.

33. **(NEW)** An ecologically friendly process of catalytic oligomerization of ethylene to low molecular weight alpha olefins, comprising the steps of:

(i) adding to a reactor a catalytic component comprising an alkyl aluminum and a solvent selected from toluene, cyclohexane, and n-octane;

(ii) admixing a catalytic component comprising a $Zr(OR)_4$ compound in an alkanol at a ratio ranging from 1:0.33 to 1:1.23, wherein R is alkyl or aryl;

*Response to Office Action in Serial No.: 09/938,122
mailed June 9, 2004 and RCE
Page 9 of 20*

(iii) and further admixing a catalytic component comprising alkyl aluminum halide; and

(iv) charging the reactor continuously with ethylene at a pressure ranging from 18 to 35 kg/cm²
at a temperature ranging from 80 to 140° C. and with a constant agitation.